

be carried out at a *loss*, which loss is the reason for an endowment. It is hard to say whether the perusal of such a Report as now lies before us impresses most with admiration for American activity or regret for English supineness.

JOHN WRIGHTSON

LETTERS TO THE EDITOR

- [The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]
- [The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

Major Greely on Ice, &c.

IN the long and interesting address of Major Greely at the special meeting of the Royal Geographical Society, held ten days ago, with the object of hearing an account of some of his proceedings during his painfully memorable Arctic expedition, the traveller dwelt so largely upon the conditions of the ice on the open Polar sea, &c., that one was led to believe that he was talking at opinions—spoken or written—by some one adverse to his own; possibly those given by myself in the communication published in *NATURE* of December 10 last may have been meant. Should this be so, anything that Major Greely has said does not in the slightest degree affect the statements made by me in the above-mentioned letter.

Major Greely tells us that Hayes, as well as *Kane* (it should be *Morton*), saw "an open Polar basin." Payer, in as high or a higher latitude at Franz Josef Land, saw, at a much earlier date in spring than Hayes and Morton did, a larger pool of open water, with "myriads" of water-fowl, but did not think of calling it an "open Polar basin," or part of one.

This idea of a great open Polar sea is almost, if not wholly, confined to our American cousins, where it seems to have taken firm root for at least thirty years past, and has, I should imagine, a spiritualistic origin, for Dr. Kane was a believer in spiritualism.

With the fear of appearing tedious, I shall quote briefly the perfect meaning, if not the exact words, of part of a letter which a distinguished spiritualist, Major —, sent to me prior to one of my Arctic expeditions. In this letter I was told that Franklin was still alive (clear proof had been obtained that he had been dead some years before the date of a *part* of this letter), and was residing at 132 (?), St Peter Street, in a seaport town called Joppa, having a population of more than 100,000 persons, on one of the lands near the Pole!

There was a large population, the Government Republican, and a fine, healthy, and salubrious climate. "These people were descendants of one of the lost tribes of Israel!"

The postscript was curious, and written at a later date than the letter itself, immediately after the death of Dr. Kane, as follows:—"Have just had communication with the spirit of Dr. Kane, whose first visit after death was paid to Franklin in Joppa, where he was still alive and well, but praying to get home."

Major Greely seems to confound two forms of ice having very different origins—namely, the floeberg, of which I have already said enough elsewhere, and the freshwater-ice, which, he says, is derived from the ice-caps of far northern lands, a mass of which he saw, having very considerable extent and "a thickness of one-sixth of a mile! with a deep valley containing a number of boulders."

This great mass of ice, 880 feet thick, with valley and rounded stones, may have been readily formed on the shores of one of the high headlands—one of which is named as having an altitude of nearly 3000 feet—along the northern portions of which Lieut. Lockwood skirted during his sledge journey on the coast of Greenland.

True, I was never in these high latitudes, but a person may sometimes be permitted to reason from analogy, as I shall attempt to do.

In 1848 I saw on the northern shore of America, in lat. 68° 40', not far from the Coppermine River, a snowdrift against a cliff about 100 feet high, and in 1849 I and my party were detained at the same place for a good many days, during which we had ample time and opportunity to examine this snowdrift,

nearly all of which was converted into ice that seemed permanent, except when parts broke off and floated away.

The slope of this snowdrift tapered towards the sea with so gentle a descent that our boat was easily hauled upon it to protect it from the ice-pack, and we with great facility carried our baggage up the ascent, and pitched our tent on the top of the cliff. A part of this snow-drift ice had broken off and drifted away, showing a very distinct stratified section, similar to that described by Dr. Moss and Major Greely.

The height of this section above sea-level was only, as far as I can remember, about 10 or 12 feet, for the water is shallow on this coast,¹ but, if Major Greely's measurements are correct, the

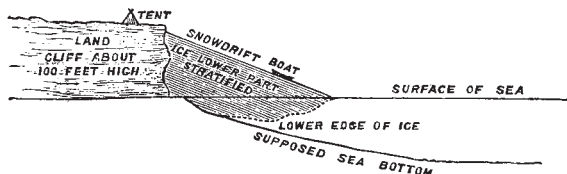


FIG. 1.—Actually seen by J. Rae in 1849, at a headland north of Coppermine River, lat. 68° 40'.

water close to the Greenland shore must be pretty deep—at least 100 fathoms—so as to float ice one-sixth of a mile thick.

My contention is that, if in latitude 69° a drift-bank of snow and ice is kept up from year to year against a cliff 100 feet high, the same thing may take place in latitude 82° to a far larger extent, where the shore is 2000 feet high, steep or precipitous, and the sea deep, so that masses of ice 800 or 900 feet thick may break off and float away.

That such great sloping snowdrifts do occur on the northern Greenland coast was proved by the difficulty met with by one of the officers of the English Expedition in travelling along them in 1876 with sledges, being forced to do so in many places by the rough ice outside, which stopped the way along the level floe.

As regards boulders, they are to be found of various sizes, more or less numerous, almost everywhere on Arctic lands high above the present sea-level, and they might have been transported to the "valley" spoken of by Greely in other ways than that supposed by him. They may have been moved downwards very slowly, by the alternate freezings and thaws of the snow and ice round them, by storms and snowdrifts, then down the slope of the valley to its lowest level, or they may have been carried by one of those streams of water similar to that mentioned as running down over the snow-caps of Grant Land. In fact, all that is wanted for this purpose would be two high,

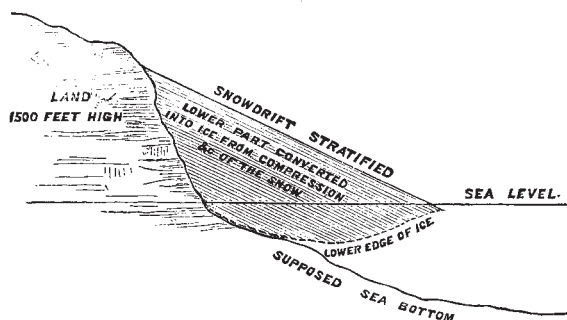


FIG. 2.—Supposed headland on the northern part of Greenland, about 1500 feet high. Greely says these headlands (or one of them) are nearly 3000 feet, having a northern or north-eastern aspect.

steep bluffs, with a deep narrow ravine between. The bluffs would give the thick masses of snow and ice-drift, and the ravine might form the bed of a stream carrying stones into the valley.

Neither Dr. Moss nor Major Greely, as far as I have noticed, have accounted for the very distinct stratification seen in the form of ice described. In all parts of Arctic America where I have been, a fall of snow is usually either accompanied or followed by a gale of wind more or less strong, chiefly from one

¹ In the very rough sketch sent, the water is made to appear much too deep; in fact, there is no pretence at correct proportion of heights and distances.—J. R.

direction, with thick snowdrift, which cuts away earth and sand in minute particles from the windward side of any hill or rising ground in its course, and these particles are carried along until they find a resting-place under the lee of some steep bank or cliff.

These foreign substances, when mixed with a great depth of snow, are not readily seen, but when the spring evaporation and thaws remove a great part of the snow, a stratum—more or less thin—of coloured matter, is visible on the surface, and this marks clearly the stratum or formation of one season. No doubt, sometimes, if there happen to be a minimum of snowdrift during the winter, followed by an unusually warm summer, all the winter deposit of snow may be removed, and the earthy deposit (naturally smaller than usual) will be added to that of the previous year.

It may be asked why I did not speak of these matters in Major Greely's presence at the meeting of the Geographical Society? This is easily explained: Major Greely's address was so long that little time was left for discussion, and this time was most properly given to the officers (four of whom were present) of the English Government Expedition of 1875-76, who, to my surprise and amusement, let the astute citizen of the United States have things pretty much his own way. In fact, one of these officers made matters rather worse than better by what he said.

JOHN RAE

4, Addison Gardens, Kensington, W., January 1

Hydrophobia—A Further Precaution

IT may be taken as an accepted fact that mongrels are more liable to rabies than well-bred dogs, both from the ill-treatment they commonly receive, and from the unnatural mingling of species that has led to their production. Statistics show that over 90 per cent. of mad dogs are retrievers, or animals so-called. In addition to these two points, it can be safely maintained that no kind of dog gives birth to so many mongrels as the retriever. Pointers, setters, terriers, and hounds will not readily breed from dogs of another class, but the reverse is true of the retriever, and the result is the production of a horrible progeny that ought to be immediately destroyed. Owners of a kennel of sporting dogs are constantly subjected to the annoyance of one of their true-bred retrievers having a litter of pups that only resemble retrievers in their coats. I would therefore suggest that the Retriever Stud Book should be kept by a Government official, and that all owners of retrievers should be obliged to send notice to him when a litter arrived; and that the police should be empowered to destroy any retriever whose owner was not provided with a certificate of registration. A few inspectors of litters could travel the country, and at a cost of a few hundreds a year prevent the development of countless mongrels—valueless for sporting purposes, hideous to look at, and sure promoters of canine madness.

H. M. TOMLIN

Rotation of Mars

PROF. BAKHUYZEN is right in regard to the number of days counted in error by Kaiser in comparing Hooke and Huyghens with recent observations. I wrote away from books, and with no means of determining whether Kaiser had made Hooke's observation a day too early or a day too late in comparing it with Huyghens's—which was what in reality he did. I saw that three days' correction would about bring matters right, and knew that in 1873 I *had* brought matters right; so concluded that was the way. But, being in London for a few days, I have looked up my paper of 1873, and find that the correction was obtained by omitting two days from Kaiser's count between Huyghens and himself, and adding one day to his count between Hooke and Huyghens.

I have not seen Prof. Bakhuyzen's paper, and the pressure of more serious business (life-duties) prevents me from giving time to such examination of it as I gave to Kaiser's in 1873. The results, however, were and are before me. It was natural I should infer that he had taken Kaiser's results as they stood. For, the comparison of either Hooke or Huyghens, using Kaiser's own dates and estimates (following him, in fact, in everything except his clerical errors in regard to the New Style date for Hooke's observations, and to the number of days in 1700 and 1800), gives no such results as Prof. Bakhuyzen has presented. Kaiser made the interval between November 1, 1862, 6h. 10'm., and August 13, 1872, 12h. 10'3m. (at which

epochs he found Mars to have been in the same position in regard to sidereal rotation), to be 69476d. 17h. 59'8m., and in this period, he said, Mars made 67,719 rotations: the resulting estimate of the rotation-period is 24h. 37m. 22'64s. In reality the interval was 69474d. 17h. 59'8m., and in this interval Mars made 67,717 rotations: the resulting estimate of the rotation-period is 24h. 37m. 22'71s. Again, using the observations of Hooke and Huyghens combined to give a mean, and the mean of the best observations between 1830 and 1870, we deduce the period 24h. 37m. 22'71s., which was, I find, the value I indicated as the most probable in 1873. Using observations up to those in 1884, I find for the period 24h. 37m. 22'703s. I find no noteworthy correction on using Maraldi's or W. Herschel's observations, with which, indeed, my inquiry began. I am satisfied the seconds are nearer 22'7 than 22'64.

RICHARD A. PROCTOR

A Meteor

AT 4.47 p.m. yesterday, whilst returning home with two friends, I saw a large meteor pass slowly downwards in an east-north-easterly direction. Unfortunately it was twilight and very cloudy at the time of the observation, and the "fireball," as one of my friends called it, was consequently shorn of much of its brilliancy. It was, however, distinctly visible behind a thin veil of cloud, and when seen for a couple of seconds in the open it seemed to have an apparent diameter about four times that of the planet Venus, which, with the crescent moon, were the only other conspicuous objects in the heavens at that time.

Brighton, January 10

W. AINSLIE HOLLIS

Meteorological Phenomena

I HAVE just received the inclosed notice of a meteorological phenomenon which you may consider of sufficient interest for publication in NATURE.

HENRY TOYNBEE

Meteorological Office, 116, Victoria Street, London, S.W.,
January 6

LEAVING the port of Kingston, Jamaica, at dusk on November 23, 1885, the night was fine and starlit overhead, but about 8 p.m. a heavy bank of cloud obscured the island, and all around the upper edges of this cloud-bank brilliant flashes of light were incessantly bursting forth, sometimes tinged with prismatic hues, while intermittently would shoot vertically upwards continuous darts of light displaying prismatic colours in which the complementary tints, crimson and green, orange and blue, predominated. Sometimes these darts of light were projected but a short distance above the cloud-bank, but at others they ascended to a considerable altitude, resembling rockets more than lightning. This state of matters continued until about 9.30 p.m., when all display of light ceased. As I have never seen such a phenomenon in any other part of the world, I have deemed it an unusual occurrence, and worthy of record.

R.M.S. *Moselle*, Southampton

T. MACKENZIE

I SHALL be obliged if you will allow me to record in your columns the following account of some remarkable phenomena witnessed during a voyage from Sunderland to London, and I trust that if you are good enough to insert this letter, it may be the means of eliciting some explanation from yourself or your readers as to the causes producing such strange effects. Capt. Herring, of the s.s. *Fenton*, reports to me as follows:—

"We left Sunderland at 3 p.m. on the 7th inst. bound for London, wind west-south-west, with snow squalls and strong sea; towards midnight wind increased, and the squalls cyclonic. When between Flamborough Head and Scarborough, the vessel became enveloped with phosphorescence, the mast-heads exhibiting the curious phenomenon known by sailors as 'Compassants' (*corpus sancti*), which in this instance were shaped like a top, about two feet at the widest part, resembling a bunch of mistletoe illuminated. The standing rigging and all protruding objects were in like manner illuminated, and the most extraordinary effect was produced when the mate, who was on the bridge with me at the time, raised his head above the canvas weather-sheeting; the whole of his hair, exposed, and beard were instantly illuminated, and in like manner his hands when elevated became phosphorescent on the outline of his mittens. When under cover of the sheeting there was no appearance of phosphorescence; it would therefore appear that the effect of the wind produced the phenomenon. The weather